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why is transfinite recursion <https://en.wikipedia.org/wiki/Transfinite_recursion> a good model for understanding – the proof that the result is well-defined uses transfinite induction. Let F denote a (class) function F to be defined on the ordinals. The idea now is that, in defining $F(\alpha)$ for an unspecified ordinal α , one may assume that $F(\beta)$ is already defined for all $\beta < \alpha$ and thus give a formula for $F(\alpha)$ in terms of these $F(\beta)$. It then follows by transfinite induction that there is one and only one function satisfying the recursion formula up to and including α .

(more will be given later): define function F by letting $F(\alpha)$ be the smallest ordinal not in the set
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